

In the Claims:

1. (currently amended) An analog to digital conversion system, comprising:
 - a first quantizer providing a first quantized output responsive ~~according~~ to a system analog input summed with ~~and according to an analog~~ noise shaped feedback signal;
 - a second quantizer ~~coupled with the first quantizer and~~ providing a second quantized output responsive ~~according~~ to the summed analog version of the first quantized output, and the system analog input, ~~and the noise shaped feedback signal;~~
 - and
 - a digital noise shaping system responsive to ~~coupled with the~~ output of the first and second quantizers and providing the noise shaped feedback signal from ~~according to~~ the second quantized output, ~~the noise shaped feedback signal being noise shaped by the digital noise shaping system with respect to a quantization error associated with the first quantizer.~~

2. (currently amended) An analog to digital conversion system, comprising:
a first quantizer providing a first quantized output according to a system
analog input and according to a noise shaped feedback signal;
a second quantizer coupled with the first quantizer and providing a second
quantized output according to the first quantized output, the system analog input, and
the noise shaped feedback signal; and
a digital noise shaping system coupled with the first and second quantizers and
providing the noise shaped feedback signal according to the second quantized output,
the noise shaped feedback signal being noise shaped by the digital noise shaping
system with respect to a quantization error associated with the first quantizer;

~~The system of claim 1,~~ wherein the first quantizer is an N-level A/D converter providing the first quantized output having one of N discrete levels, wherein the second quantizer is an M-level A/D converter providing the second quantized output having one of M discrete levels, M and N being integers greater than 1, and wherein N is less than M.

3. (previously presented) The system of claim 2, wherein N is 3 or more and M is 64 or more.

4. (previously presented) The system of claim 1, wherein the second quantizer is an M-level A/D converter providing the second quantized output having one of M discrete levels, and wherein the number of levels M of the second quantizer determines a noise floor of the analog to digital conversion system.

5. (previously presented) The system of claim 1, wherein the first and second quantizers are flash A/D converters.

6. (previously presented) The system of claim 1, wherein the first and second quantizers individually comprise switched capacitor circuits.

7. (previously presented) The system of claim 1, wherein the digital noise shaping system comprises a switched capacitor circuit.

8. (previously presented) The system of claim 7, wherein the digital noise shaping system comprises a digital bandpass filter system.

9. (previously presented) The system of claim 1, wherein the digital noise shaping system comprises a digital bandpass filter system.

10. (currently amended) An analog to digital conversion system, comprising:
a first quantizer providing a first quantized output according to a system
analog input and according to a noise shaped feedback signal;
a second quantizer coupled with the first quantizer and providing a second
quantized output according to the first quantized output, the system analog input, and
the noise shaped feedback signal; and
a digital noise shaping system coupled with the first and second quantizers and
providing the noise shaped feedback signal according to the second quantized output,
the noise shaped feedback signal being noise shaped by the digital noise shaping
system with respect to a quantization error associated with the first quantizer;
wherein the digital noise shaping system comprises a digital bandpass filter
system.

~~The system of claim 9,~~ wherein the digital bandpass filter system comprises:
a first digital bandpass filter coupled with the second quantizer and providing
a first filtered output according to the second quantized output;
a third quantizer coupled with the first and second quantizers and providing
the noise shaped feedback signal according to the first filtered output and according to
a filtered feedback; and
a second digital bandpass filter coupled with the first digital bandpass filter
and with the third quantizer, the second digital bandpass filter providing the filtered
feedback according to the noise shaped feedback signal and according to the first
filtered signal.

11. (previously presented) The system of claim 9, wherein the noise shaped
feedback signal is noise shaped by the digital noise shaping system with respect to a
quantization error associated with the first quantizer.

12. (previously presented) The system of claim 1, wherein the digital noise shaping system comprises:

a plurality of digital bandpass filter systems coupled with the second quantizer, the digital bandpass filter systems having different filter pole and zero locations; and

a multiplexer coupled between the digital bandpass filter systems and the first quantizer, the multiplexer providing the noise shaped feedback signal according to a selected one of the digital bandpass filter systems.

13. (previously presented) The system of claim 12, wherein the plurality of digital bandpass filter systems individually comprise:

a first digital bandpass filter coupled with the second quantizer and providing a first filtered output according to the second quantized output;

a third quantizer coupled with the first and second quantizers and providing the noise shaped feedback signal according to the first filtered output and according to a filtered feedback; and

a second digital bandpass filter coupled with the first digital bandpass filter and with the third quantizer, the second digital bandpass filter providing the filtered feedback according to the noise shaped feedback signal and according to the first filtered signal.

14. (previously presented) The system of claim 13, wherein the noise shaped feedback signal is noise shaped by the digital noise shaping system with respect to a quantization error associated with the first quantizer.

15. (previously presented) The system of claim 1, wherein the noise shaped feedback signal is noise shaped by the digital noise shaping system with respect to a quantization error associated with the first quantizer.

16. (currently amended) A bandpass delta sigma modulator, comprising:
a first quantizer providing a first quantized output responsive ~~according~~ to a system analog input and ~~according~~ to a noise shaped feedback signal; and
a digital error feedback system coupled ~~to~~ with the first quantizer and providing the noise shaped feedback signal responsive ~~according~~ to the first quantized output and including a second quantizer coupled to the first quantizer and providing a second quantized output responsive to the first quantized output, the system analog input, and the noise shaped feedback signal; and
a digital noise shaping system coupled to the first and second quantizers and providing the noise shaped feedback signal.

17. (canceled)

18. (currently amended) The bandpass delta sigma modulator of claim ~~16~~ 17, wherein the digital noise shaping system comprises a digital bandpass filter system.

19. (previously presented) The bandpass delta sigma modulator of claim 18, wherein the digital bandpass filter system comprises programmable poles and zeros.

20. (previously presented) The bandpass delta sigma modulator of claim 18, wherein the digital bandpass filter system comprises:

a first digital bandpass filter coupled with the second quantizer and providing a first filtered output according to the second quantized output;

a third quantizer coupled with the first and second quantizers and providing the noise shaped feedback signal according to the first filtered output and according to a filtered feedback; and

a second digital bandpass filter coupled with the first digital bandpass filter and with the third quantizer, the second digital bandpass filter providing the filtered feedback according to the noise shaped feedback signal and according to the first filtered signal.

21. (previously presented) The bandpass delta sigma modulator of claim 18, wherein the noise shaped feedback signal is noise shaped by the digital noise shaping system with respect to a quantization error associated with the first quantizer.

22. (previously presented) The bandpass delta sigma modulator of claim 18, wherein the digital noise shaping system comprises:

a plurality of digital bandpass filter systems coupled with the second quantizer, the digital bandpass filter systems having different filter pole and zero locations; and

a multiplexer coupled between the digital bandpass filter systems and the first quantizer, the multiplexer providing the noise shaped feedback signal according to a selected one of the digital bandpass filter systems.